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Implementation of Social Community Cloud via Social Networks

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Abstract—**Social Network is a community deployment model network where a set of community members, groups or organizations interact and communicate, explore the social relationship where social networking is a service where people can share data resources and communicate in bi-directional with web based multimedia. Social Network platforms provided a best way to communicate and interact, where apps become more sophisticated, the cloud infrastructure is provisioned for exclusive use by specific social community of consumers from a group or organization that have shared concerns. It may be owned, managed and operated by one or more of the organizations in the community a third party or some combinations of them, and it may exist on or off premises. In this paper we discussed the Design and implementation procedures of social private community cloud based network where users can share web and multimedia based data and information. And large amount of data such as photographs, videos and text data can be stored in highly secured private cloud. The role of Deferred Acceptance Algorithm is discussed, developed and proved. We focused on social cloud computing which is designed to enable access to elastic compute capabilities provided through a cloud fabric constructed over resources contributed by socially connected peers. The social traverse networks enable edge users to provide resources to and consume resources from, one another. Mathematical and Algorithmic approach is given along with the experimental analysis on a data set. In this paper we concentrated on different security measures for data security and storage where data in rest or transit, including multi-tenancy along with data lineage and provenance. Finally we concluded with discussion of application implementation and result analysis.**

Keywords- **Cloud Security, Social Networks, Deferred Acceptance Algorithm, vulnerabilities.**

I. INTRODUCTION

Most of the cloud users are business professionals; the major concern regarding cloud usage is its security and reliability. As the utility services such as water, gas and electricity are chargeable per user consumption; cloud is also chargeable based on the consumption [1]. Physical security of cloud servers is related to the physical access control to the servers that control the physical security protocols and monitoring of defense system from vulnerabilities. The major solution to secure the cloud data from the physical threat is to encrypt sensitive data while the data in cloud storage or in transit. At the time of retrieval the decryption should be done for only the data which is required, it is safe to keep data in encrypted form so the cryptography plays a great role to secure the cloud data storage at physical security level. Regular backups should be taken and recovery tools should be used in case of disasters to maintain the Data Security [2]. Different security methods should be followed at Network security level such as Network Intrusion Detection System and Firewalls, which controls irregular traffics and packet losses in networks, it also monitors port scans, Denial of attack services, vulnerability exploit attempts. The cloud host should be secured to prevent from risks, threats and attacks. At Host level web application security should be maintained, monitored and protected from SQL Injection flaws, data validations and In-secured storage [3]. The cloud data storage service relieves the burden of data protection and maintenance. Most important service in cloud storage is protection from vulnerable monitoring, risks, threats and attacks or failures, it would bring permanent losses to cloud users since their data or archives are stored into an uncertain and undefined storage pool since the cloud user does not have any idea where it is stored outside the enterprises. These security risks come from the cloud infrastructures, which should be much more powerful and reliable than personal computing devices, local area networks and personal servers. To overcome from the risks the cloud audit system architecture should be maintain properly and every actor in this architecture to fulfill their duties. Cloud Service Provider is one who provides data storage service and has enough storage spaces and computation resources; The Third Party Auditor is who has capabilities to secure the cloud users confidential data and manages or monitor outsourced data under the delegation of data owner [4].

Social network platforms have rapidly changed the way that people communicate and interact. They have enabled the establishment of, and participation in, digital communities as well as the representation, documentation and exploration of social relationships. We believe that as ‘apps’ become more sophisticated, it will become easier

for users to share their own services, resources and data via social networks. To substantiate this, we present a social compute cloud where the provisioning of cloud infrastructure occurs through "friend" relationships. In a social compute cloud, resources owners offer virtualized containers on their personal computers, laptops or smart devices to their social network. However, as users may have complex preference structures concerning with whom they do or do not wish to share their resources, we investigate, via simulation, how resources can be effectively allocated within a social community offering resources on a best effort basis. In the assessment of social resource allocation, we consider welfare, allocation fairness, and algorithmic runtime. The key findings of this work illustrate how social networks can be leveraged in the construction of cloud computing infrastructure and how resources can be allocated in the presence of user sharing preferences.

II. REALATED WORK

Cloud Computing draw a great attention of industry, researchers, academics and business world, as most talented and emerging paradigm which provides services over the internet where there are great challenges emerged in securing the sensitive confidential user data against intruders. Cloud Computing provides mobility which is developing very fast, it facilitates the employees work from where they want, it provides a complete stack which contains applications, data storage and device management. It provides the employees the flexibility to work from where they are, that is to be productive outside the office while addressing very approachable, flexible and secured system.

Cloud Computing allows more open accessibility and easier and improved data sharing. Data is uploaded into a Cloud and Stored in a datacenter, for access by users from the data center. Security is a major Issue; these are mainly deal with identity and access management, prevention of data loss and malware attack control management. When an organization moving to a cloud, so many issues will be on screen among them are Is my data secure on cloud? And can others access my confidential data? So Security is the key inhibitor to cloud adoption.

Cloud Storage enables users to store data remotely and retrieve on requirement of the cloud user, without maintaining any software or hardware. Cloud storage in Cloud environment is different comparing with other architecture where the user's data is moved to large data centers, which is remotely located, on which user does not have any control, So Monitoring and Management System plays a great role in Cloud Security.

Cloud Computing builds a future-proofed cloud, which increases automation, agility and control, which simplifies Information Technology and empower employees which improves productivity and collaboration and mobility. In the

Cloud, everything is data, everything can be copied or moved, in the past the servers were physical hardware, now the hardware is virtualized and services are software instances. All the devices were virtualized such as routers, switches etc.,

Virtualization is a fundamental technology in cloud computing which transformed the face of the modern data center and referred the abstraction of computer resources such as processor, storage, network, memory, application stack and database. Virtualization is a technology that enables multi – tenancy cloud that can share resource platform for all tenants. The major task in cloud computing is securing the virtual server.

Data and Information Security in Cloud monitored and maintained by the concepts of CIA and AAA where CIA Triad is the Security concept in cloud computing which means Confidentiality, Integrity and Availability where as AAA is Information Security Mechanism used in Cloud Computing which means Authentication, Authorization and Auditing.

III. SOCIAL CLOUD NETWORK

Social computing is an area of cloud network that is concerned with the intersection of social behavior and cloud network systems. It is based on creating or recreating social conventions and social contexts through the use of software and technology. Thus, blogs, email, instant messaging, sharing of photographs and videos, social network services, wikis, social bookmarking and other instances of what is often called social software illustrate ideas from social computing, but also other kinds of software applications where people interact socially.

A social cloud platform is the technical implementation of the construction and facilitation of the social cloud as well as necessary middleware to enable resource sharing between "friends" at the edges of the internet. A social technical adapter is the means to observe and interpret social ties for the elicitation or derivation of sharing preferences. A social economic model is the formulation of social micro-economic system for the allocation of resources upon the premises of social ties, and preferences with respect to how social ties denote a user-specific willingness to consume and/or provide resources.

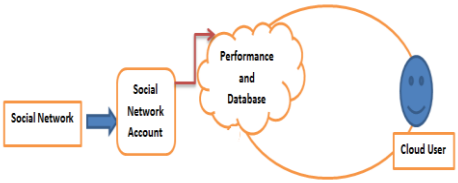

Figure 1: Block diagram Social Compute Cloud and its Architecture

To facilitate the social sharing, and the construction of sharing preferences, a social cloud requires access to users' social networks. We propose using a social adapter, rather than implementing the platform as a social network application. A social network cloud user can access and communicate with the members of the community social cloud network. The social compute cloud facilitates preference-based sharing of computational infrastructure using several different preference matching algorithms. The Deferred Acceptance Algorithm is the best algorithm for two-sided matching and has the advantages of having a short runtime and at the same time always yields a stable solution. However, it cannot provide guarantee about welfare, and yields a particularly unfair solution that one side gets the best stable solution whereas the other side gets the worst stage solution.

Deferred Acceptance Algorithm

The deferred acceptance algorithm won Nobel Prize for economics 2012 for allotments of workers to factories in a given area using economics. It is generally used in hospitality and Tourism industry to match customer preferences and services.

If you have a group of men and if you have a group of women, the deferred acceptance algorithm designed which would pair everyone up with a stable match?

- Where each man proposes to his highest ranked women?
- If a woman is not engaged she is automatically accepts?
- If she is engaged, she picks per preferred man
- The rejected man moves on to this next highest ranked woman
- Once each man is engaged the problem is solved

The resulting marriages are stable because if a man prefers another woman, she has already rejected him. If a woman prefers another man, he could not have proposed and so must be with his higher preference. Stable here means that that has no two people would prefer to be together rather than in their respective "marriages".

We can easily identify the unstable pairs which are most often lower for the matching strategy than the random strategy here not sharing the user friend user their wish of not count for the list of friends the system enables resource sharing using social networks without the exchange of money and relying on a notion of trust to avoid free riding. Like our approach, they use virtual containers to provide virtualization within the existing virtual machine instance; however our approach using programming level virtualization provides a much more light weight model at the expense of flexibility.

The algorithm supports the social networks where every user can be seeing like friend and list unlike friend, the list can be increase and decrease. It proposes extensions to several well-known scheduling mechanisms for task assignments. Their approach considers resource endowment and physical network structure as core factors in the allocation problem, which are different considerations for resource allocation. They analyses the potential of a social cloud via simulation, using several co-authorship and friendship networks as input. They observe how a social cloud performs based upon variations in load, participation and graph structure. Like friend list count increase their list of view.

Mathematical Analysis of Social Network

Social Network of a Graph theory has aspects that connect it with other areas ofMathematics such as algebra, geometry, topology, numerical analysis,matrix theory, combinatorics and so on. The expressive powerof the graph models placing special emphasis on connectivity between objects has made them the models of choice in chemistry,physics, biology, and networks. Graph theory is a young butrapidly maturing subject. Within the quarter of a century, concurrentwith the growth of such areas as computer science, electricaland computer engineering, and operations research, graph theoryhas seen explosive growth.

A graph consists of a finite nonempty set V = V (G) of p vertices and a set E = E(G) of q pairs of vertices of V called edges. A graphics determined by its edge and vertex set, so if G is a graph, we can write G = (V; E). Similarly, V (G) and E(G) denote the vertex set and edge set of a graph G, respectively.

A graph is connected if every pair of vertices are joined by a path. A maximal connected sub-graph of G is called a component of G.

A social network is a social structure made up of a set of social actors (such as individuals or organizations) and a set of the dyadic ties between these actors. The social network perspective

provides a set of methods for analyzing the structure of whole social entities as well as a variety of theories explaining the patterns observed in these structures. The study of these structures uses social network analysis to identify local and global patterns, locate influential entities, and examine network dynamics.

Computer networks combined with social networking software produces a new medium for social interaction. A relationship over a computerized social networking service can be characterized by context, direction, and strength. The content of a relation refers to the resource that is exchanged. In a computer mediated communication context, social pairs exchange different kinds of information, including sending a data file or a computer program as well as providing emotional support or arranging a meeting. With the rise of electronic commerce, information exchanged may also correspond to exchanges of money, goods or services in the "real" world. Social network analysis methods have become essential to examining these types of computer mediated communication.

IV. CONCLUSION

The social compute cloud platform is that enables the sharing of infrastructure resources between friends via digitally encoded social relationships. Using our implementation, users are able to execute programs on virtualized resources provided by their friends. To construct a Social Compute Cloud, we have extended Seattle to access user based social networks, allow users to elicit sharing preferences, and utilize matching algorithms to enable preference-based socially-aware resource allocation.

Preference-based resource matching is a social compute cloud related problem, where the social network focuses on security, different secured distributed algorithms which focuses on scenario which the interacting players know the identity of all nodes in the network, and protects the structural information that is edges of the network.

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